

Application No. 09/747,521  
Amendment dated August 12, 2003  
Reply to Office action of May 7, 2003  
Docket Number 22727/04079

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the above-identified application:

**Listing of Claims:**

Claims 25, 28-30, 32-40, and 44 have been cancelled.

23. (currently amended) A nucleic acid based immunogenic composition for protecting a mammalian subject against challenge with lethal toxin of *B. anthracis*, said immunogenic composition comprising a vector which comprises a polynucleotide which encodes a full-length, mature mutated lethal factor (LF) protein or an immunogenic fragment of LF protein, said polynucleotide being operably linked to a promoter which drives expression of the full-length, mature mutated LF protein or the immunogenic fragment of LF protein in cells of the mammalian subject; wherein the full-length, mature mutated LF protein comprises a sequence which is the same as the sequence of the full-length, mature wild-type LF protein except for a mutation that eliminates the metalloproteinase activity of the full-length, mature, mutated LF protein, and wherein the immunogenic fragment of LF protein comprises amino acid 42 through amino acid 285 of SEQ ID NO. 2, and lacks metalloproteinase activity.

wherein said vector is selected from the group consisting of a DNA plasmid, a viral vector construct, and a bacterial vector construct.

24. (currently amended) The nucleic acid based immunogenic composition of claim 23, wherein the nucleic acid based composition further comprises a vector which comprises a polynucleotide which encodes a full-length, mature *B. anthracis* protective antigen (PA) protein or an immunogenic fragment thereof to the subject, wherein said polynucleotide which encodes a full-length mature *B. anthracis* PA protein or an immunogenic fragment thereof is operably linked to a promoter which drives expression of the full-length, mature PA protein or the immunogenic fragment thereof in cells of the mammalian subject, wherein said full-length mature *B. anthracis* PA protein comprises amino acid 30 through amino acid 764 of SEQ ID NO. 4, and wherein said immunogenic fragment of the *B. anthracis* PA protein comprises amino acid 204 through amino acid 764 of SEQ ID NO. 4.

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26. (original) The immunogenic composition of claim 24 wherein the LF polynucleotide and the PA polynucleotide are on separate DNA constructs.
27. (original) The immunogenic composition of claim 24 wherein the LF polynucleotide and the PA polynucleotide are on the same DNA construct.
31. (previously amended) The nucleic acid based immunogenic composition of claim 23 wherein the polynucleotide encodes a polypeptide comprising sequentially amino acid 34 through amino acid 719 of the amino acid sequence set forth in SEQ ID NO. 2, an amino acid other than glutamic acid, and amino acid 721 through amino acid 809 of the sequence set forth in SEQ ID NO. 2.
41. (previously amended) The nucleic acid based immunogenic composition of claim 23 wherein the polynucleotide is incorporated into a mammalian expression vector.
42. (previously amended) The nucleic-acid based immunogenic composition of claim 24 wherein the polynucleotide that encodes the full-length, mature mutated LF protein or immunogenic fragment thereof and the polynucleotide that encodes the full-length, mature PA protein or immunogenic fragment thereof are incorporated into the same or separate mammalian expression vectors
45. (previously added) The nucleic acid based composition of claim 41 wherein the mammalian expression vector is a viral expression vector.
46. (previously added) The nucleic acid based composition of claim 41 wherein the eukaryotic expression vector is a eukaryotic expression plasmid.
47. (previously added) The nucleic acid based composition of claim 42 wherein the polynucleotide that encodes the full-length, mature, mutated LF protein and the polynucleotide that encodes the full-length mature PA protein are incorporated into the same or different viral expression vectors.
48. (previously added) The nucleic acid based composition of claim 42 wherein the polynucleotide that encodes the full-length, mature, mutated LF protein and the polynucleotide that encodes the full-length mature, mutated PA protein are incorporated into the same or different eukaryotic expression plasmids.

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49. (previously added) The nucleic acid based composition of claim 23 wherein the polynucleotide that encodes the mature, mutated LF protein or an immunogenic fragment of the LF protein is a DNA molecule that does not become integrated into the genome of the mammalian subject's cells.
50. (previously added) The nucleic acid based composition of claim 23 wherein the polynucleotide that encodes the mature, mutated LF protein or an immunogenic fragment of the LF protein is an RNA molecule.
51. (new) A nucleic acid based composition which induces an immune response in an animal, said composition comprising a polynucleotide which encodes a full-length, mature mutated lethal factor (LF) protein or an immunogenic fragment of LF protein, said polynucleotide being operably linked to a promoter which drives expression of the full-length, mature mutated LF protein or the immunogenic fragment of LF protein in cells of the mammalian subject; wherein the full-length, mature mutated LF protein comprises a sequence which is the same as the sequence of the full-length, mature wild-type LF protein except for a mutation that eliminates the metalloproteinase activity of the full-length, mature, mutated LF protein, and wherein the immunogenic fragment of LF protein comprises amino acid 42 through amino acid 285 of SEQ ID NO. 2, and lacks metalloproteinase activity.
52. (new) The nucleic acid based immunogenic composition of claim 51, wherein the nucleic acid based composition further comprises a polynucleotide which encodes a full-length, mature *B. anthracis* protective antigen (PA) protein or an immunogenic fragment thereof to the subject, wherein said polynucleotide which encodes a full-length mature *B. anthracis* PA protein or an immunogenic fragment thereof is operably linked to a promoter which drives expression of the full-length, mature PA protein or the immunogenic fragment thereof in cells of the mammalian subject, wherein said full-length mature *B. anthracis* PA protein comprises amino acid 30 through amino acid 764 of SEQ ID NO. 4, and wherein said immunogenic fragment of the *B. anthracis* PA protein comprises amino acid 204 through amino acid 764 of SEQ ID NO. 4.
53. (new) The method of claim 51 wherein said isolated nucleic acid and said promoter comprise a construct selected from the group consisting of a linearized DNA, linearized RNA, a DNA plasmid, a viral vector, and a bacterial vector.